

Wind Energy

www.campbellsci.com/wind-energy

Benefits of Our Systems

1. Systems perform long-term, unattended data collection.
2. Systems can be configured for wind assessment or turbine performance applications.
3. Dataloggers have on-board mathematical and statistical capabilities.
4. Time-stamped data is recorded allowing historical analyses.
5. Pagers, radios, phones, and other devices can report alarm conditions.
6. Electrical devices can be controlled based on time or measured parameters.
7. Rugged, low power design allows systems to operate in harsh environments.



Wind Monitor



CR1000



CR200



A Campbell Scientific datalogging system monitors this offshore wind farm located between Rhyl and Prestatyn in North Wales at about 7 to 8 km out to sea (photo courtesy RADTech Ltd. UK).

Campbell Scientific offers data acquisition systems that monitor conditions at wind assessment sites, at producing wind farms, and along transmission lines. Key components include high-speed dataloggers, sensors, communications devices, software, and towers.

The reliability of our systems ensures data collection, even under adverse conditions. Wide operating temperature ranges and weather-proof enclosures allow our systems to operate reliably in harsh environments.

Dataloggers

Our dataloggers make and record measurements, control electrical devices, and can function as PLCs or RTUs. Because they have their own power supply (batteries, solar panels), the dataloggers continue to measure and store data and perform control during power outages.

The dataloggers include many different channel types, allowing nearly all sensor types to be measured on a single unit. For example, one datalogger can measure strain on turbine blades, wind speed, and power output of the turbine, even while controlling peripheral devices. The CR1000 with two LLAC4 peripherals can measure up to 10 low-level ac output anemometers. Our CR200-series dataloggers, deployed in a wireless network configuration, can provide cost effective monitoring at each level of a wind assessment tower while avoiding long cables.

Up to 2 million data points can be stored in the datalogger's non-volatile memory, while CompactFlash® cards can be used to increase data storage to tens of millions of points. Data is time- and date-stamped to provide key information for identifying and analyzing past events.

Measurement Capabilities

Channel types include analog (single-ended and differential), pulse, switched excitation, and digital. Each of these channels can be independently programmed for various sensor types. Most sensors connect directly to the datalogger, eliminating the need for external signal conditioning. Multiplexers and other peripherals can be used with most of our dataloggers to increase the numbers and types of channels.

Control Capabilities

Powerful on-board instruction sets allow unattended measurement and control decisions based on time or conditional events. Dataloggers can be programmed to perform multiple control functions based on different scenarios. For example, alarms can be triggered, phone numbers dialed, or equipment shut down if the system detects an equipment failure—all without human intervention.

Sensors

Typical sensors for wind assessment applications include, but are not limited to: sonic anemometers, three-cup and propeller anemometers, wind vanes, temperature sensors (air, water, and equipment), barometric pressure, wetness, and solar radiation. Monitoring electrical current, voltage, wattage, stress, and torque may be added for turbine performance applications.

Communications

Multiple telemetry and on-site options for retrieving data or reporting site conditions allow our systems to be customized to meet exact needs. Communications options include direct connect, radio, telephone, cellular phone, voice-synthesized phone, satellite, and Ethernet. Systems can be programmed to send alarms or report site conditions by calling out to computers, phones, radios, and pagers.

Software

Our PC-based support software simplifies the entire data acquisition process, from programming to data retrieval to data display and analysis. Our software automatically manages data retrieval from networks or single stations. Robust error-checking ensures data integrity over almost any communications link.

Towers

IsoTruss (Brigham City, Utah) offers 50, 60, or 82 meter tilt-up towers. These towers are built from carbon fiber, which is very strong and lightweight. Wind sensors can be mounted anywhere along the length of the tower. Many sensor mounting options are available for IsoTruss, NRG, or non-guyed towers.



View from one of the anemometers on the meteorological tower to the monopiles and turbines of a wind farm (photo courtesy npower renewables).



This wind assessment site uses a Campbell Scientific data acquisition system to collect data from an IsoTruss tower and sensors.

If you need assistance selecting the best wind sensor, tower, telemetry, and datalogger combination, please contact us. We'd be happy to answer your questions and provide the most cost-effective solution for your needs.